2025–2026 Physics Lecture Course Topics

Weekly Sample Schedule (no class week of ASTRO, winter break, or June-August):

1. Intro and Fundamentals, Atomic Structure
2. Charged Particle Interactions
3. Photons Interactions, Dose, Kerma
4. Photons Interactions, Dose, Kerma
5. Radioactive Decay
6. Radiation Generators and Accelerators
7. Radiation Generators and Accelerators
8. Radiation Measurements, Detections, and Calibrations
9. Radiation Measurements, Detections, and Calibrations
10. Imaging for Radiation Therapy
11. Imaging for Radiation Therapy
12. First 30-Minute Q&A
13. Patient Setup, Simulation, and Segmentation
14. Patient Setup, Simulation, and Segmentation
15. Treatment Planning: Classical, 3DCRT
16. Treatment Planning: Classical, 3DCRT
17. Dose Ratios and MU Calculations
18. Electron Therapy
19. Electron Therapy
20. Dose Calculation Algorithms
21. IMRT and Optimization
22. SRS, SBRT, and Special Procedures (e.g., TBI, IORT, BetaCath)
23. SRS, SBRT, and Special Procedures (e.g., TBI, IORT, BetaCath)
24. Second 30-Minute Q&A
25. Radiation Protection, Shielding, Safety, and Regulation
26. Brachytherapy
27. Brachytherapy
28. Brachytherapy
29. Proton, Heavy Ion, and Neutron Therapy
30. Proton, Heavy Ion, and Neutron Therapy
31. Hyperthermia Physics
32. Artificial Intelligence and Machine Learning
33. Medical Error and Failure Mode Analysis
34. Final 30-Minute Q&A